
Shortage Warning (To view press release please [click here.](#))

[Water Shortage Notification System Explained](#)

****Read the latest National Weather Service drought statement [here.](#)****

Statewide Summary of Drought Development

 **Updated Aug. 30, 2007** 

Drought conditions have deepened across Kentucky after a week with only sporadic occurrences of isolated showers and thunderstorms. Most of the state has seen less than one half of an inch of rainfall during the past 7 days. Storms that developed during the day on Aug. 29th appear to have brought beneficial rains in excess of one inch to scattered areas in the Licking, Kentucky, Salt and Green River basins. These storms provide temporary relief when they occur, but do very little in affecting the extreme hydrologic drought that now covers over 80 percent of the state.

High demand continues to be a problem for many water suppliers.

The Division of Water has received numerous reports of water suppliers that are struggling to keep up with customer demand. Many of these systems report that outdoor water use is still common and that requests for voluntary conservation are either not have much of an impact on demand or are being ignored altogether. The drought of 2007 is not a typical dry spell, and can be counted among the most severe drought events statewide since 1953. Droughts of this level of severity

require modifications to our water use in order to maintain a safe and reliable supply of water to each customer of a water system. It is imperative that citizens comply with local water suppliers' requests for water conservation steps at this time. Local water suppliers are doing all that they can to assure a safe and reliable supply but the demand side of the equation must be managed as well. Demand management can be achieved if customers act together to reduce consumption in accordance with local water supplier requests. Further reductions in demand are possible but mandatory restriction and possible enforcement for violations. The Division of Water strongly encourages all Kentuckians to:

- Recognize our situation for what it is: an extreme hydrologic drought that shows no signs of significant improvement in the immediate future.
- Comply as fully as possible with the local water conservation measures that are in place in many communities
commit to continued vigilance as a participant in a community effort to manage water shortage issues at the local level.

Water supply sources are declining statewide.

The state's water sources have held up remarkably well considering the severity of the drought and its extremes in both precipitation and temperature. However, at some point the continued lack of significant recharge can take its toll on many water sources that are typically not prone to problems during extended dry spells in most years.

Streamflows - Streamflows have improved slightly in some areas as a result of the storms that moved across Kentucky on Aug. 29-30, 2007.

- Current readings from stream gages indicate low-normal to normal flows in portions of the following river basins: Big Sandy, Little Sandy, Tygarts, Salt, Upper Cumberland above Wolf Creek dam Little River in the Lower Cumberland river basin.
- The remaining areas of the state are experiencing abnormally low-flows with much below-normal flows occurring in the mainstem Kentucky River between Lee County and Jessamine County, in the South Fork of the Kentucky River and most of the Licking River basin. Further to the west, most of the Green River and its tributaries is much below-normal flow for time of year, including the Barren River, Nolin River and Rough River.

Useful Drought Indicators

PRECIPITATION

Rainfall deficits across the state continue to grow. Precipitation for the past 30 days in the Eastern, Bluegrass and Central climatic divisions averaged 48 percent of

normal (39, 48 and 56 percent of normal respectively) while the Western climatic division received an average of only 20 percent of normal.

STREAMFLOWS

The spotty nature of recent precipitation has yielded improvements to streamflows that are isolated at best. Without increased precipitation, expect many streamflows that are now normal to return to below-normal and those that are already below normal to continue to decline.

LAKE ELEVATIONS

While most small water-supply lakes are not abnormally low, they continue to decline under the stress of high temperatures and lack of precipitation. Increased customer demand has forced a number of these water systems to call for conservation measures. Lakes under the control of the [Huntington District](#), [Louisville District](#) and [Nashville District](#) of the U.S. Army Corps of Engineers continue to operate along their normal lake elevation curves. Two exceptions are the Barren River Reservoir in Barren County and Rough River reservoir in Breckinridge County. Barren River reservoir is having difficulty bringing the elevation to normal pool and is currently down by 4.1 feet. Discharges from the dam have been at or near the minimum release most of the time since Mar. 20, 2007. Releases from Corps of Engineers reservoirs are important to the status of many Kentucky rivers as sources of supply for drinking water, assimilation of wastewater discharges, water quality and aquatic habitat. These rivers include the Green, Barren, Rough, Nolin, Kentucky, Salt, Licking and Big Sandy rivers.

DROUGHT INDICES

Assessing the severity of a drought is made easier with the use of drought indices that combine various source information into a single representative value of drought severity. The [Palmer Drought Severity Index](#) uses data for precipitation, temperature and evapotranspiration (the water returned to the atmosphere through the combined actions of evaporation and plant growth) to calculate a number that can be compared across different times and locations. This index was developed in the 1960's in Kansas and Nebraska but has since become a part of drought monitoring in a majority of the United States. The Palmer Drought Severity Index is updated weekly on Monday afternoons.

The [Drought Monitor](#) represents a comprehensive assessment of several factors that contribute to the development of drought or that indicate the severity and potential persistence of drought. The Drought Monitor is updated weekly on Thursday mornings.

 **Updated Aug. 30, 2007** 

The Palmer Drought Severity Index and the Drought Monitor indicate severe to extreme drought across Kentucky.

The Palmer Drought Severity Index issued on Aug. 27, 2007, places the Central and Bluegrass climatic divisions in severe drought status (-3.25 and -3.50 respectively). The West and East climatic divisions (-4.39 and -4.13) are now in Extreme Palmer Drought.

It is important to note that the Palmer Drought Severity Index is used as a general index of drought over large geographic areas defined by the four climatic divisions of Kentucky. Rainfall that affects one part of a climatic division may substantially improve drought conditions on a county or multi-county level but have little or no impact on the regional average conditions defined by the Palmer Index.

 **Updated Aug. 30, 2007** 

The Drought Monitor now places a majority of the state into extreme agricultural and hydrologic drought status. The area delineated as extreme has pushed further north to include all counties between Gallatin and Lawrence counties. An area along the Ohio River, north of a line from Henderson to Grayson to Carroll counties remain in severe drought status.

As a drought indicator, the Drought Monitor is not limited to four large climatic divisions, rather it incorporates the Palmer Index as just one of several indicators of drought development in a given area. These other indicators include more short-term components including the Crop Moisture Index, Standardized Precipitation Index and weekly streamflow percentiles. The Palmer Drought Severity Index and the Drought Monitor should be considered in combination with more localized data such as rainfall, streamflows, groundwater levels and climatic outlooks to form an accurate assessment of drought severity in a given location.

Drought Monitoring

Drought is a natural and recurring feature of our climate that can be considered a "severe" weather event much like a tornado, a flood or a hurricane. However, there are a few key differences that distinguish drought from other weather events that make it difficult to detect, track and respond to drought.

Part of the difficulty in detecting drought is in the lack of an obvious onset of drought conditions. A drought develops slowly and can appear to mimic a normal spell of dry weather in the summer, a time of the year when dry weather is accepted and expected. Short-term rainfall shortages create problems for agricultural crops, livestock, urban landscapes and other activities that depend on stored soil moisture between rainfall events. We are accustomed to dealing with short-term dry spells in part because there is an expectation that rainfall is just around the corner. However, when rainfall shortages persist for weeks or months at a time, activities that depend on long-term storage of water will be adversely impacted as well. Droughts in Kentucky can have serious negative consequences for drinking water supplies, energy production, commercial and industrial operations, recreation and aquatic

habitat.

The negative impacts of drought cannot be avoided but there are ways to reduce them to a manageable level. All water suppliers in the commonwealth should have a water shortage response plan to guide both the supplier and customer during a drought event. It is important for customers to listen to their water suppliers and be ready to take necessary actions to prevent a water shortage problem from developing. This is critical to a successful outcome because the only way to effectively manage the source of water supply is to first manage the demand for water.

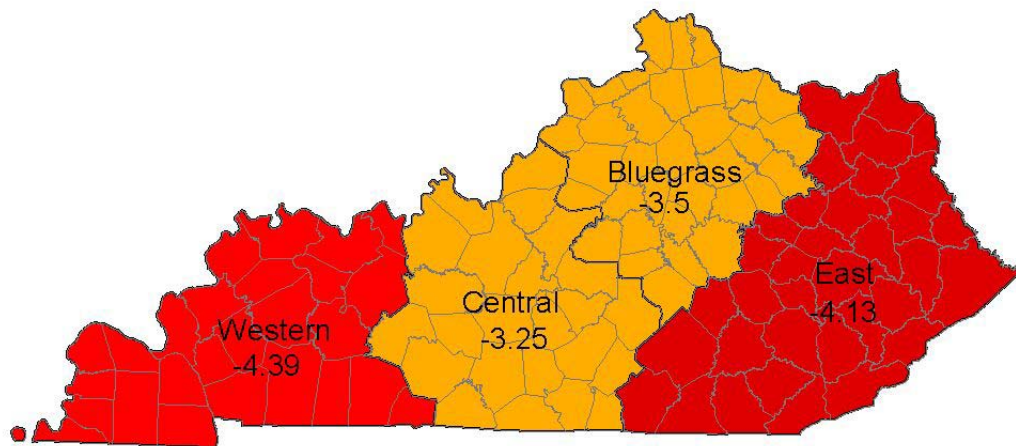
There is no easy method for determining when a dry spell has become a drought, how long a drought will persist or how intense a drought may become. However, by closely tracking certain sources of information, referred to as drought indicators, it is possible to detect potential drought development early enough to allow at least some lead-time for notification and initiation of drought response preparations at the local level. The Division of Water monitors for the potential development of drought in Kentucky by tracking precipitation, streamflows, lake levels, groundwater and water supplies. There are also several tools that are useful in assessing the severity of a "dry spell" and the potential impacts to agriculture, forest fires, water supplies and other vulnerabilities to drought. These tools include the Palmer Drought Severity Index, the Drought Monitor, the Standardized Precipitation Index and several others.

The Drought Monitoring pages will be updated on a weekly basis to provide timely information and assessments of current drought conditions in Kentucky. There will also be numerous links to other resources and drought information pages from various state and federal agencies.

 **Updated Aug. 30, 2007** 

Palmer Drought Severity Index The Palmer Drought Severity Index (PDSI) is compiled weekly by the Central Region Climate Prediction Center (National Centers for Environmental Prediction, National Weather Service and National Oceanic and Atmosphere Administration) and provided on the University of Kentucky Agricultural Weather Center's Web site. This index is useful for placing a developing drought into context with past droughts and serves as a measure of current conditions. The index also provides a standardized assessment of developing drought conditions that can be compared between different areas of the state or even between different states.

PDSI values can be categorized as follows:

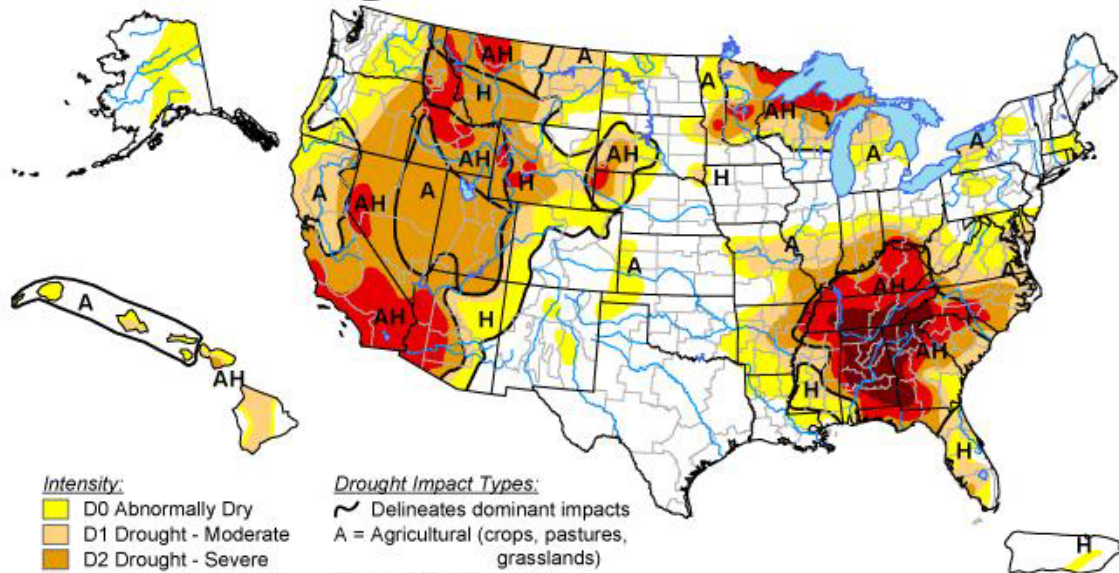


- 0 to -0.99 = near normal
- -1.00 to -1.99 = mild drought
- -2.00 to -2.99 = moderate drought
- -3.00 to -3.99 = severe drought
- -4.00 and below = extreme drought

[The Drought Monitor](#)

U.S. Drought Monitor

August 28, 2007
Valid 8 a.m. EDT



Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

Drought Impact Types:

- ~ Delineates dominant impacts
- A = Agricultural (crops, pastures, grasslands)
- H = Hydrological (water)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://drought.unl.edu/dm>

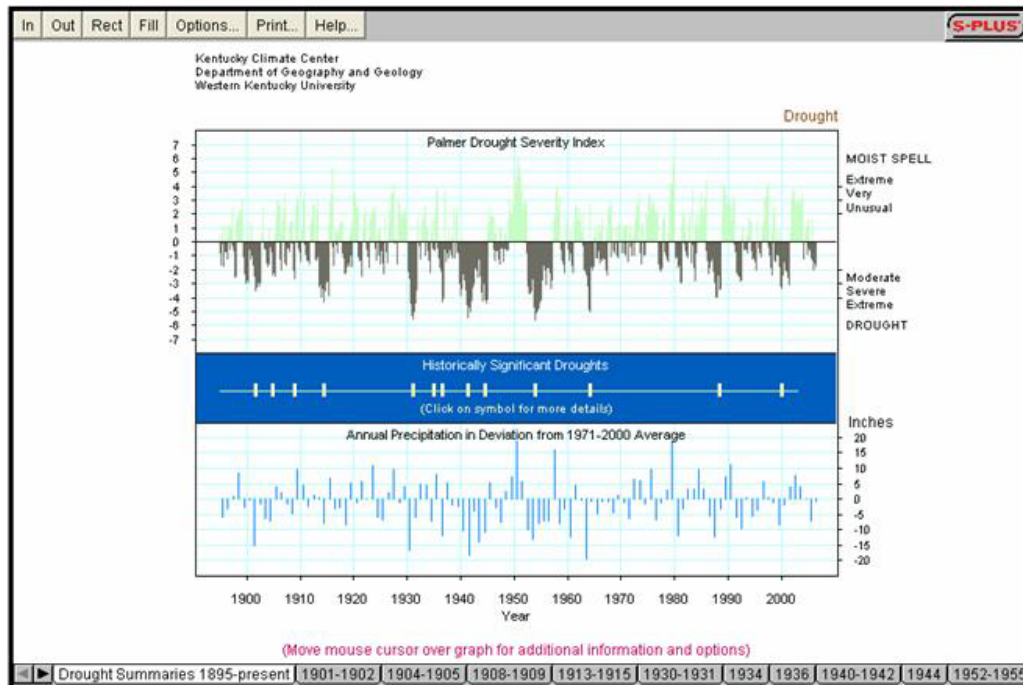


Released Thursday, August 30, 2007

Author: Thomas Heddinghaus, CPC/NOAA

Tracking drought blends science and art. No single definition of drought works for all circumstances, so people rely on drought indices to detect and measure droughts. But no single index works under all circumstances, either. The Drought Monitor is a synthesis of multiple indices, outlooks and news accounts, that represents a consensus of federal and academic scientists. A detailed description of the parameters used to create the Drought Monitor can be found [here](#).

[Kentucky Climate Center](#) Historical Drought Data



Interactive graphs displaying drought indices since 1895 for Kentucky's four climate divisions. Users can identify and explore the development of historically significant droughts.

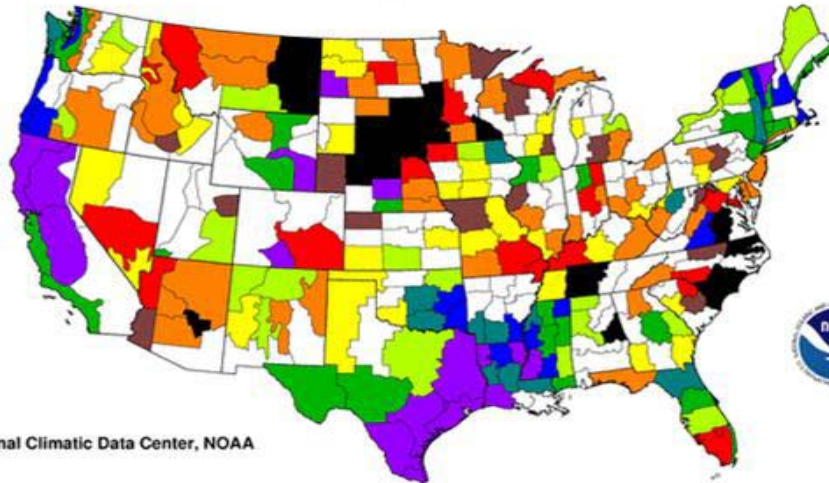
Examining the past can be a useful tool in interpreting the significance of a developing drought situation. Comparisons of the current drought to the historical record provide a frame of reference for evaluating how serious the current drought has become, and how it might develop in the coming months. One of the best tools to evaluate past droughts is found at the Kentucky Climate Center at Western Kentucky University. Click on the figure at the left to visit this site and learn more about the history of drought in Kentucky.

[The Standardized Precipitation Index](#)

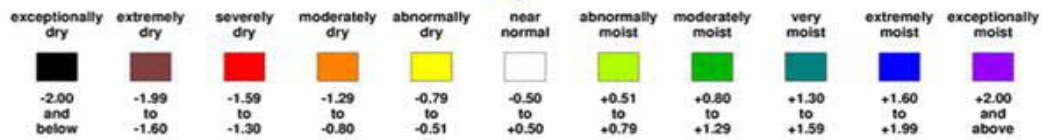
The Standardized Precipitation Index (SPI) is a way of measuring drought that is different from the PDSI. Like the PDSI, this index is negative for drought and positive for wet conditions. But the SPI is a probability index that considers only precipitation, while Palmer's indices are water balance indices that consider water supply (precipitation), demand (evapotranspiration) and loss (runoff).

Standardized Precipitation Index One Month

July 2007

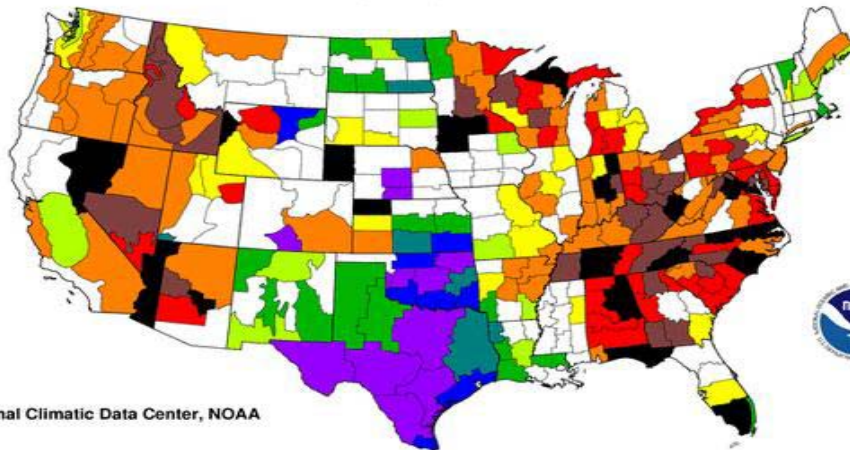


National Climatic Data Center, NOAA

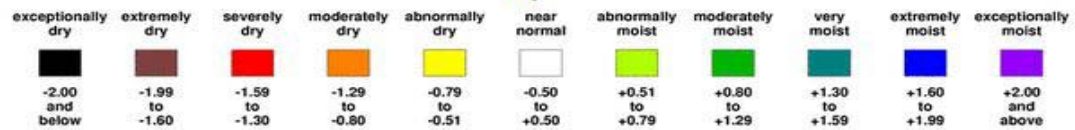


Standardized Precipitation Index Three Months

May-July 2007

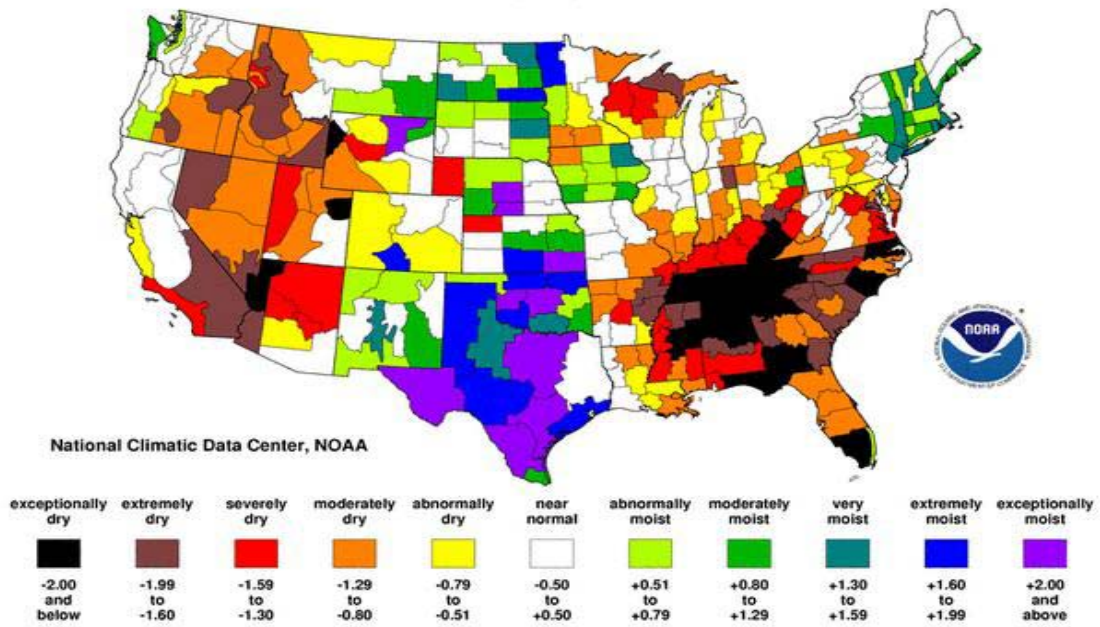


National Climatic Data Center, NOAA

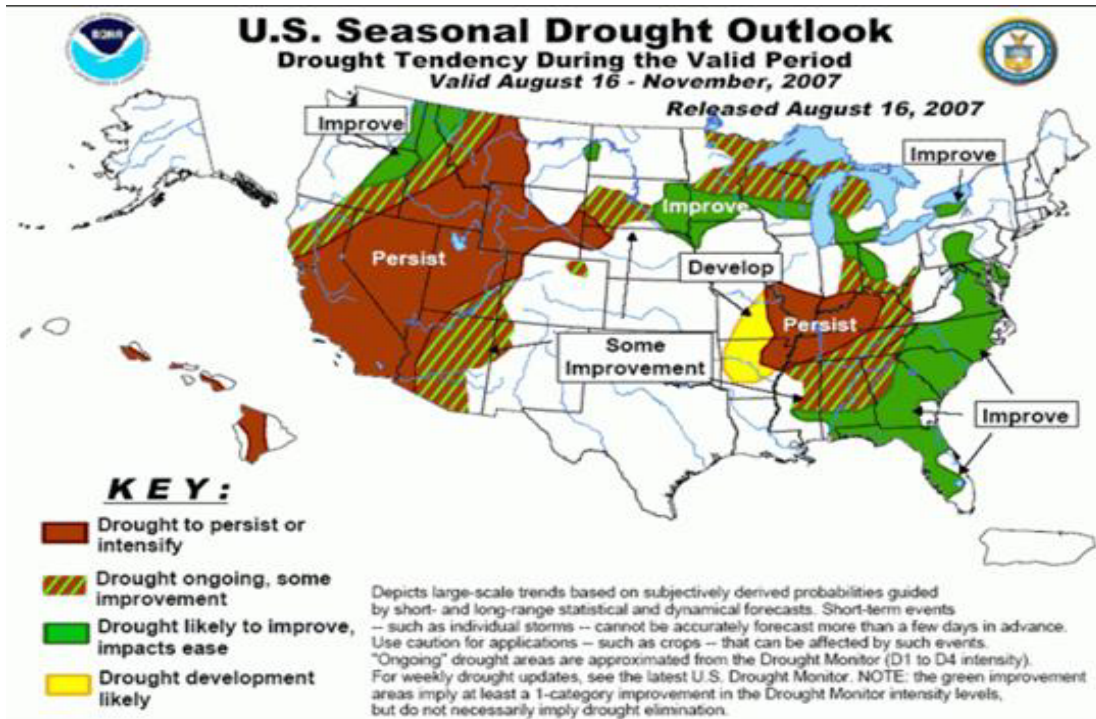


Standardized Precipitation Index Six Months

February-July 2007



U.S. Seasonal Drought Outlook



The Climate Prediction Center issues the U.S. Seasonal Drought Outlook each month in conjunction with the release of the long-lead temperature and precipitation outlooks.

Weather and Climate

PRECIPITATION

The Division of Water monitors a network of 24 daily climate-reporting stations to track developing shortages of precipitation. For the year, precipitation deficits for Kentucky range from 63 percent of normal in the Eastern climatic division to 78 percent of normal in the Bluegrass climatic division.

Updated Aug. 30, 2007

(Click on images to enlarge)

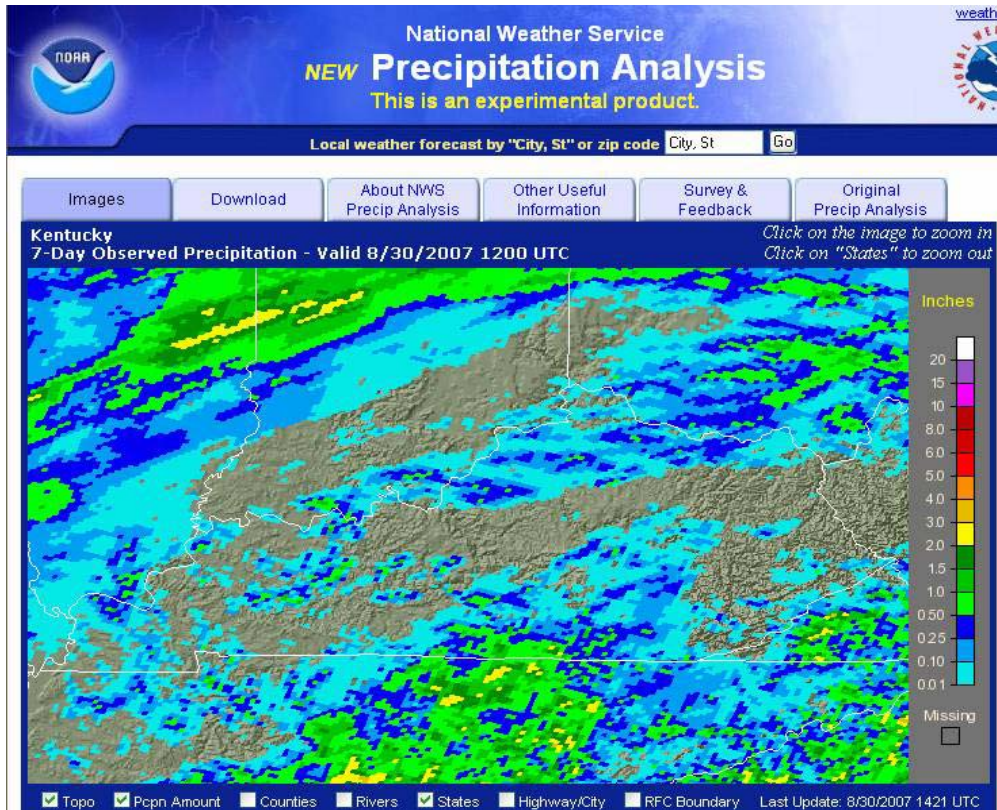
Precipitation: Data for the previous 30/60/90-day period and the Water Year Beginning October 01, 2006

Station	Water Year		30/60/90 Day Total Precipitation and Departure From Normal					
	Precipitation Totals (inches)	Departure From Normal (inches)	30 Day Total (inches)	30 Day Departure (inches)	60 Day Total (inches)	60 Day Departure (inches)	90 Day Total (inches)	90 Day Departure (inches)
Henderson	32.27	1.35	1.29	-3.28	5.88	-2.85	9.26	-4.06
Paducah	33.68	-1.04	2.32	-2.63	5.75	-4.04	8.72	-5.87
Princeton	30.11	-6.18	2.05	-2.88	5.96	-3.64	8.32	-6.07
Mayfield	27.58	-10.52	0.60	-4.16	3.85	-5.93	5.75	-9.21
Louisville	30.34	0.04	1.19	-3.26	6.33	-2.39	9.31	-3.87
Bardstown	27.05	-2.41	0.61	-3.84	5.24	-3.16	8.62	-3.98
Hardinsburg	29.47	-4.05	1.24	-3.48	5.51	-3.58	7.82	-5.70
Campbellsville	29.07	-6.24	1.69	-3.51	7.53	-2.45	11.86	-2.88
Nolin Lake	30.33	-5.12	3.35	-1.90	8.12	-1.79	10.49	-3.60
Glasgow	27.72	-8.33	1.38	-3.63	6.30	-3.32	9.49	-4.98
Bowling Green	25.25	-10.23	2.58	-2.26	6.60	-2.63	7.55	-6.52
Covington	24.60	-3.06	0.92	-3.31	3.46	-4.58	6.07	-6.02
Williamstown	32.10	2.93	1.80	-2.53	5.99	-2.51	12.43	-0.56
Spindletop	21.72	-7.66	1.30	-3.07	4.69	-3.63	7.17	-5.35
Lexington	26.89	-2.48	2.22	-2.14	5.96	-2.35	8.75	-3.76
Dix Dam	24.47	-6.36	1.26	-3.38	5.62	-3.30	9.45	-3.70
Berea	24.11	-6.60	1.49	-3.28	5.69	-3.41	9.30	-3.93
Grayson	24.78	-2.65	1.82	-2.06	5.34	-2.71	8.35	-3.19
Jackson	21.76	-9.63	1.88	-2.52	4.27	-4.27	5.67	-7.06
Quicksand	20.38	-11.12	1.87	-2.65	4.21	-4.45	5.60	-7.24
Buckhorn Lake	18.13	-12.27	0.63	-3.51	3.84	-4.09	6.00	-6.04
London	21.97	-9.18	0.96	-3.29	5.88	-2.32	6.66	-5.77
Somerset	26.75	-7.78	1.30	-3.80	5.31	-4.23	7.63	-6.30
Cumberland Gap	20.80	-14.40	0.30	-4.44	4.62	-4.30	7.75	-5.93

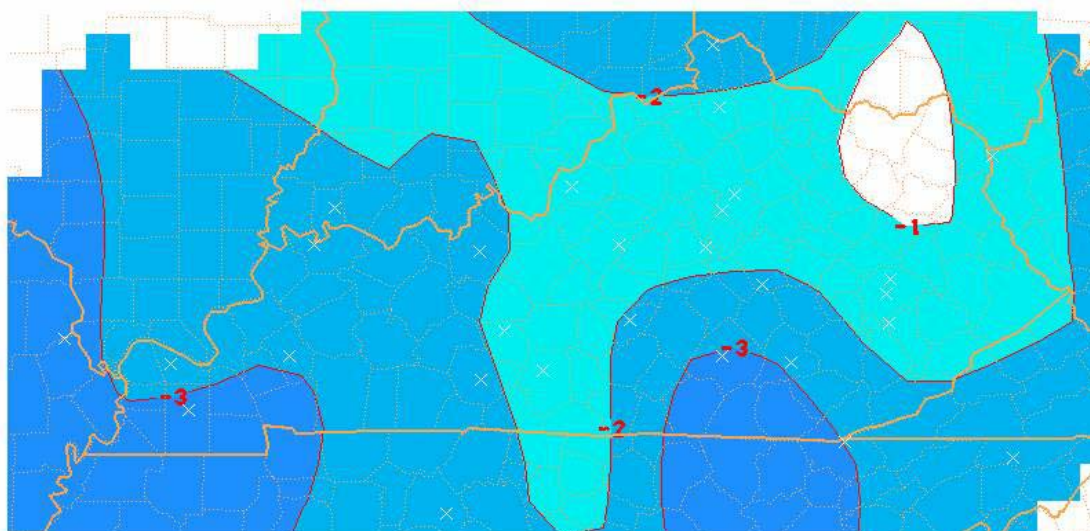
Climatic Division	Normal Precip. Water Year	Normal Precip. Calendar Year	Percent of Normal Precipitation				
			Water Year	Calendar Year	30 Day	60 Day	90 Day
Western (1)	45.77	33.51	82	68	20	40	59
Central (2)	45.51	33.86	83	77	56	74	75
Bluegrass (3)	42.55	30.77	84	78	48	83	75
Eastern (4)	43.52	32.51	68	63	39	69	64

Rainfall deficits across the state continue to grow. Precipitation for the past 30 days in the Eastern, Bluegrass and Central climatic divisions averaged 48 percent of normal (39, 48 and 56 percent of normal respectively) while the Western climatic division received an average of only 20 percent of normal.

For the 30-day period ending Aug. 29, 2007, average precipitation amounts of 0 to 3 inches were measured across the Central, Bluegrass and Eastern climatic divisions. Lesser amounts, about 0 to 2 inches, were measured across the Western climatic division. Statewide, the combined precipitation for the months of January through July of this year ranked as the sixth driest for the period since at least 1895 -- the first year of the instrumental record.

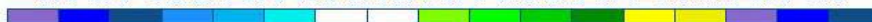


ATTENTION: One of the best tools to assess the amount and distribution of precipitation in Kentucky is the National Weather Service's [Precipitation Analysis Product](#). Data can be displayed for many different time frames and can be selected to show not only the amounts, but also the deficits and percentages of normal for each time frame.



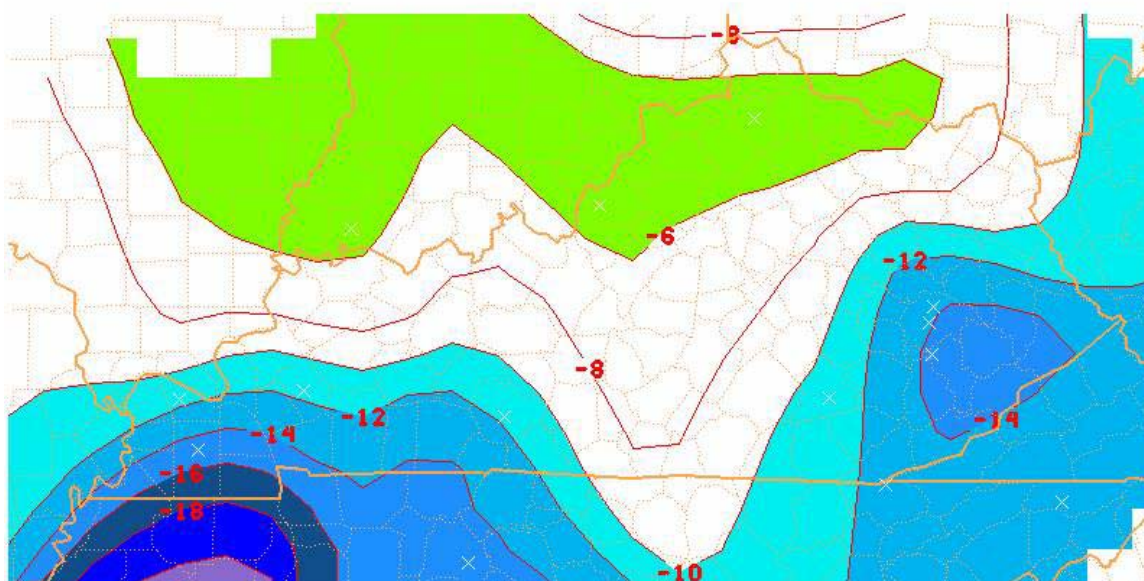
08/30/07 - 30 Day Precip Deviation from Normal (Inches)
Ending 7 pm Yesterday

-6.0 -5.0 -4.0 -3.0 -2.0 -1.0 -0.50 0.0 0.5 1.0 2.0 3.0 4.0 5.0 6.0 7.0



UK

University of Kentucky
College of Agriculture



08/30/07 - Precip Deviation from Normal Since Jan 1 (Inches)
Ending 7 pm Yesterday

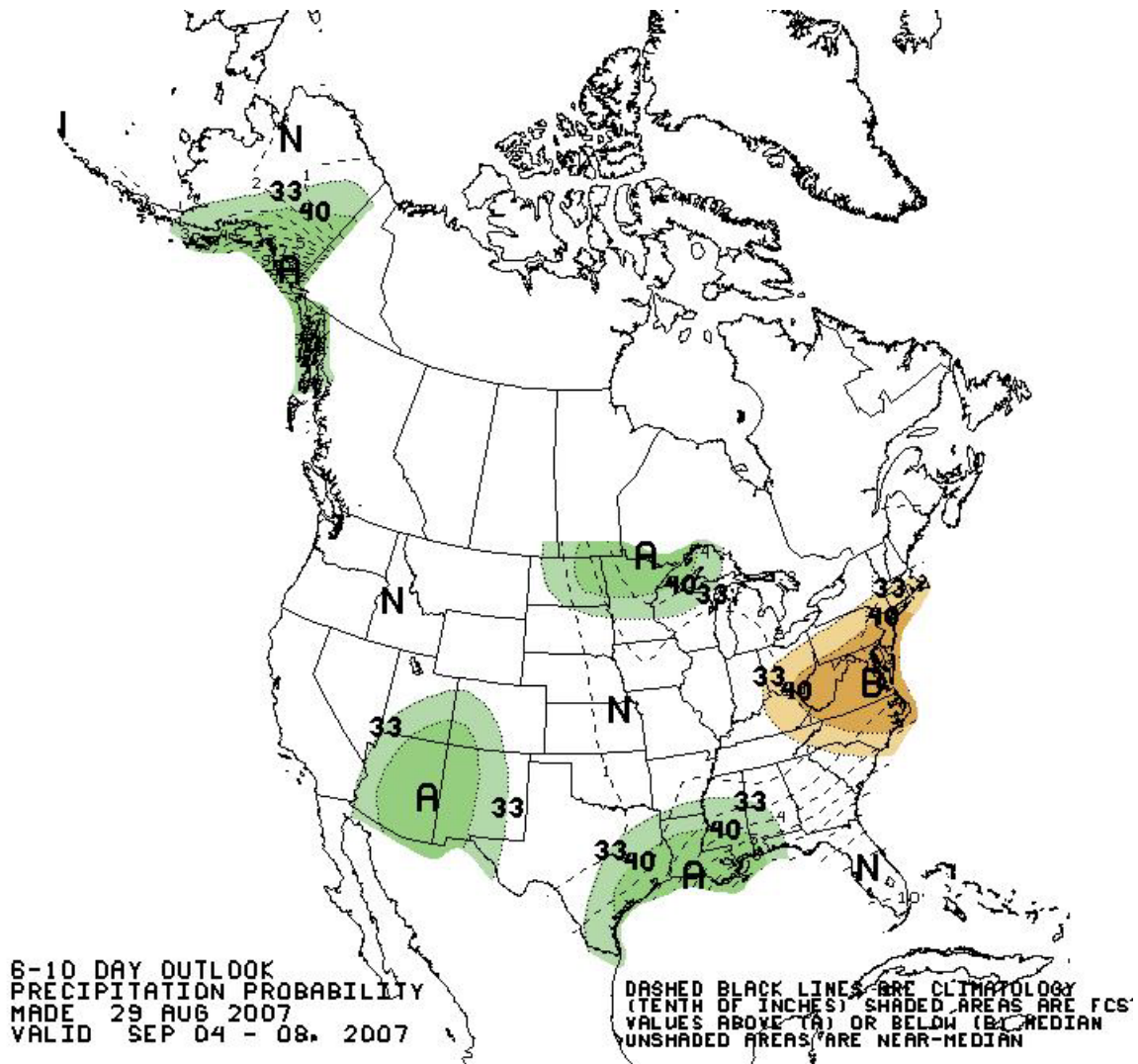
-20 -18 -16 -14 -12 -10 -8 -6

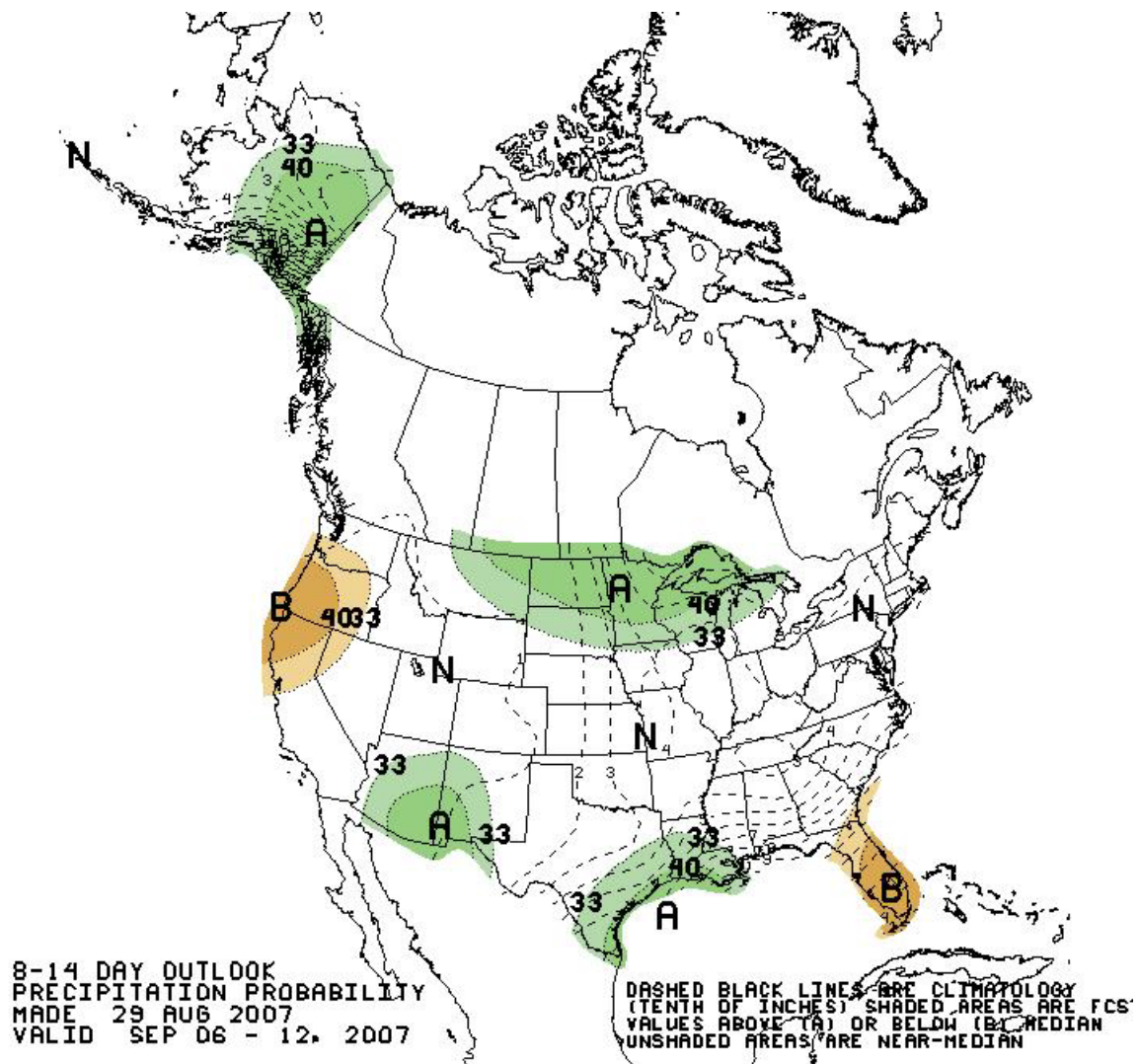


UK

University of Kentucky
College of Agriculture

For the year, the largest deficits remain in the southern portions of the Western and Eastern climatic divisions. Ten to 18-inch precipitation deficits have built in parts of the Purchase area of the west. The headwaters of the Kentucky, Licking, Cumberland and Big Sandy river basins in the east have areas with deficits from 10 to 16 inches for the year. Central and northern Kentucky deficits range from 4 to 10 inches in the Bluegrass and parts of south-central Kentucky.





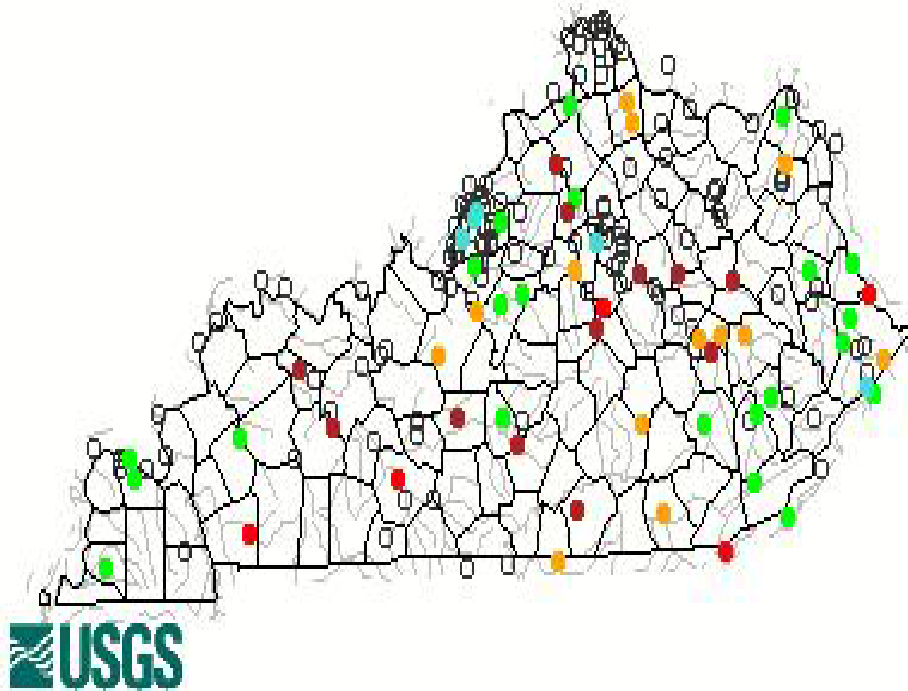
Short-term outlooks from the Climate Prediction Center indicate below normal chances for precipitation during the next two weeks. Outlooks for the next one to three months indicate equal chances for below-normal, normal and above-normal rainfall for the state.

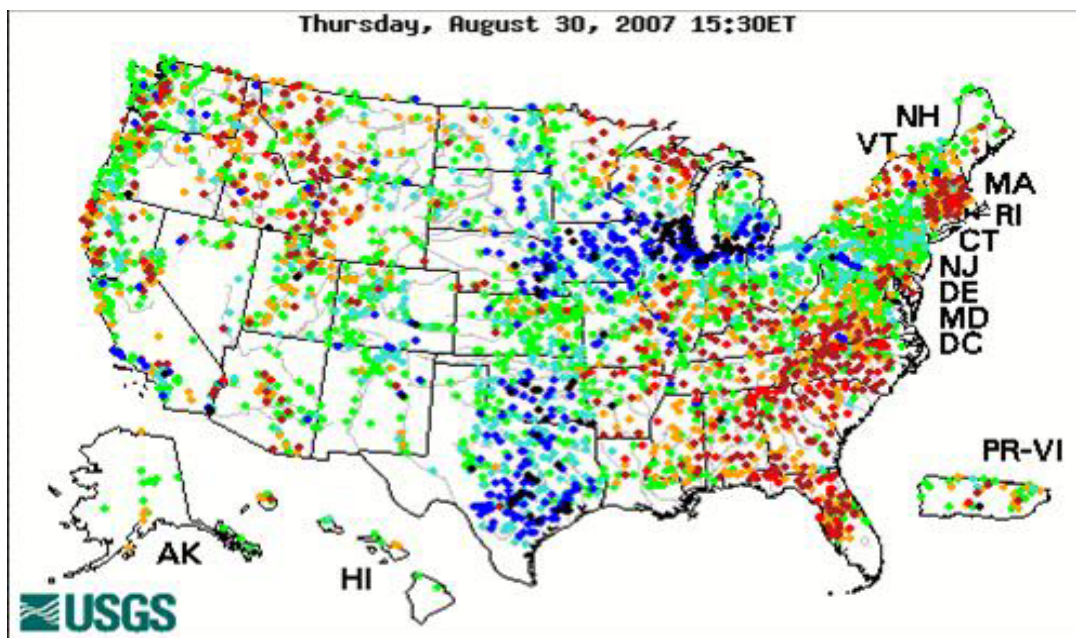
Hydrology

STREAMFLOWS

The [U.S. Geological Survey](#) maintains a [real-time stream gauging network](#) that monitors flows in all major river basins in Kentucky. Measurements of streamflow are a very good indicator of the longer-term hydrologic impacts of drought. During the developing stages of drought, streamflows provide valuable information on the severity and regional extent of emerging problems. Streamflow data is evaluated relative to the long-term record to determine drought intensity and identify potential problems associated with water shortages. Once a drought has matured, streamflow measurements are critical at many locations where water withdrawals have the potential to cause adverse environmental impacts to streams.

Thursday, August 30, 2007 12:30ET





Updated Aug. 30, 2007

A system that developed in the evening on Aug. 29, 2007, dropped 0.25 to 2 inches of rain on portions of central, eastern and western Kentucky. The spotty nature of the precipitation from this event has yielded improvements to streamflows that are isolated at best. This rainfall in conjunction with that from the previous week have helped maintain flows in the Salt River basin where most streams are within a normal range for this time of year. Streamflows in the Purchase area and the Big Sandy, upper Kentucky and Tradewater river basins also reside mostly in a normal range for this time of the year. Flows in the Green, Upper Cumberland and Lower Cumberland River basins and the mainstem Kentucky River are mostly below normal. The poor flows on the mainstem Kentucky River have not been seen since the drought of 1999. Without continued timely precipitation, expect many streamflows that are now normal to return to below-normal in the coming week.

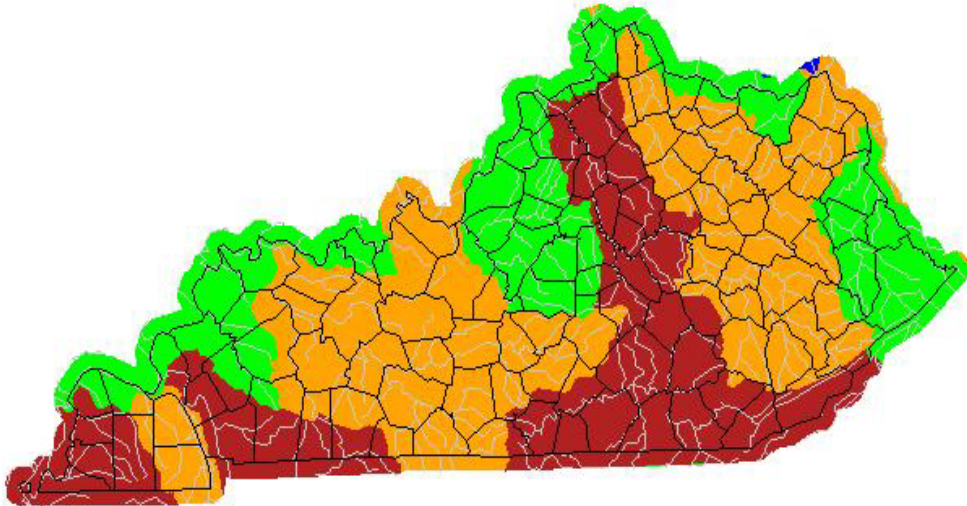
Weekly and Monthly Streamflow

For a slightly longer-term perspective of streamflow conditions across Kentucky, the United States Geological Survey computes average flows for the previous seven, 14 and 28 days. The resulting average streamflow values are categorized relative to the long-term record and assigned levels of severity based on the frequency that similar magnitudes of low-flow have occurred in the past. By averaging over a period of several days to several weeks, the values on the map are more indicative of longer-term conditions than daily average or real-time streamflow measurements.

Updated Aug. 30, 2007

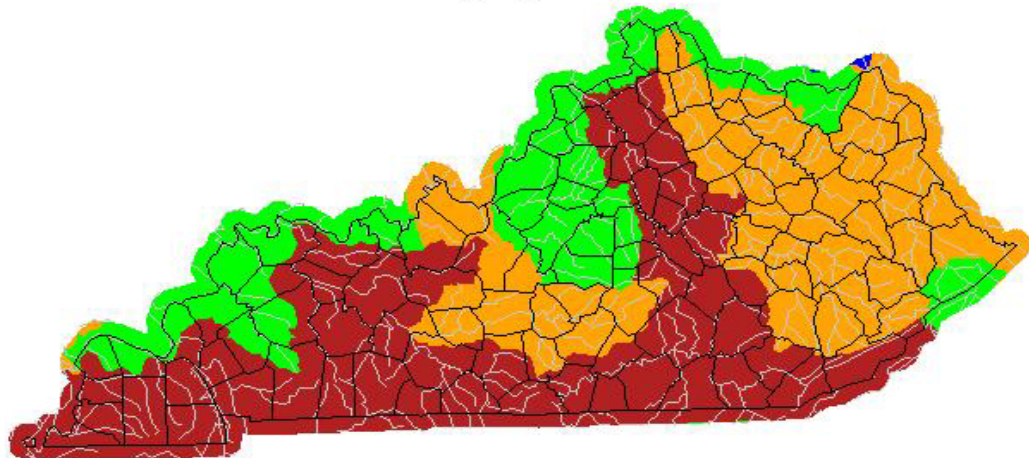
Seven-Day Average Streamflow

Wednesday, August 29, 2007



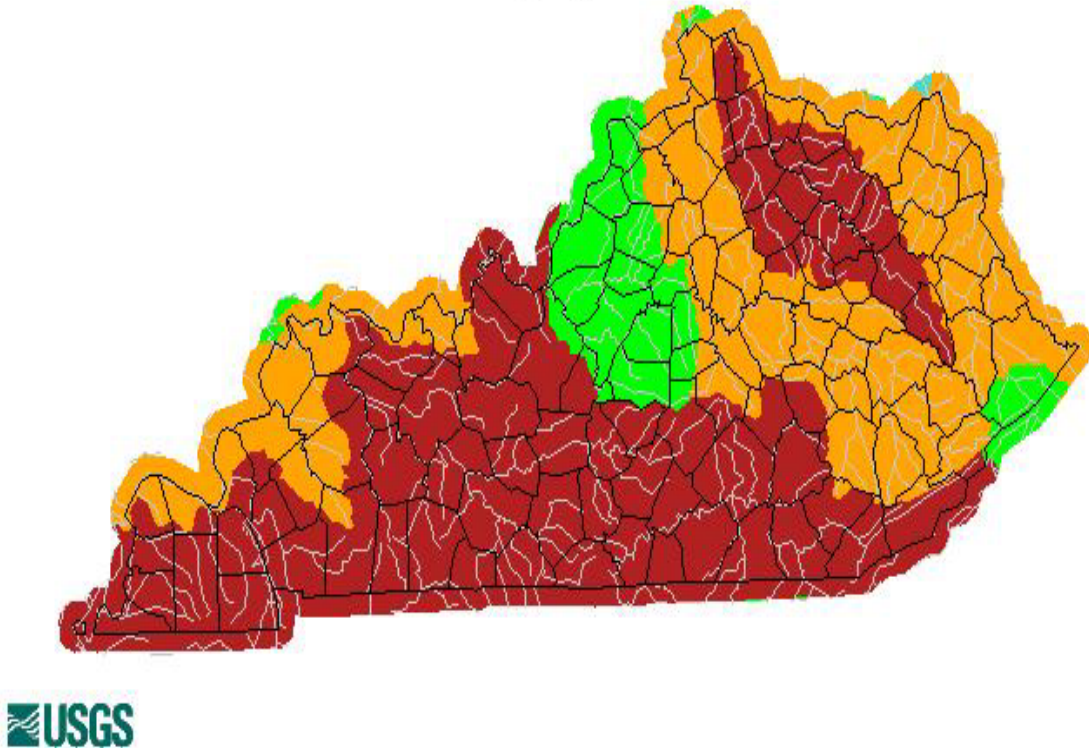
14-Day Average Streamflow

Wednesday, August 29, 2007



28-Day Average Streamflow

Wednesday, August 29, 2007



The 28-day average streamflow indicates that flows are significantly below normal in the Licking river basin, Upper and Lower Cumberland river basins, Tradewater river basin, Green river basin and throughout the Purchase region. Elsewhere, long-term flows remain below normal in the Kentucky, Tradewater, Big Sandy and Little Sandy river basins. Flows in the Salt River basin are within a normal range for the same period. Water availability for water supplies, irrigation and other uses may be adversely affected as streamflows continue to decline.

Lakes and Reservoirs

U.S. Army Corps of Engineers Projects

Another useful measure of the impact that drought is having on a region is the status of area lakes and reservoirs. The Division of Water monitors data from 12 projects operated by the U.S. Army Corps of Engineers (USACE) from three USACE districts: [Louisville](#), [Huntington](#) and [Nashville](#). These projects strive to maintain reservoirs at pool levels consistent with the operating guidelines as part of the larger mission of flood control and navigation in the Ohio and Mississippi rivers. Beginning in April, the releases from the reservoirs are managed to allow filling to the "normal summer pool elevation." Significant precipitation deficits in the basin above the reservoir can adversely affect the attainment of normal summer pool elevation. This, in turn, may

result in low flows in the river below the project when releases from the reservoir are reduced to the minimum needed for water quality and aquatic habitat.

By examining the data for "current pool elevation" and "current outflow," valuable information about the status of large headwater areas above the USACE reservoirs can be obtained.

 **Updated Aug. 30, 2007** 

**United States Army Corps of Engineer Reservoir Information
Updated Aug. 30, 2007**

August 30, 2007				
Basin	Project	Current Outflow (cfs)	Normal Summer Pool Elevation (ft)	Current Pool Elevation (ft)
Little Sandy	Grayson	25.2	645	642.7
Big Sandy	Dewey	27.2	650	650.3
	Fishtrap	76.3	757	755.8
	Yatesville	23.3	630	629.3
	Paintsville	12.4	709	708.6
Licking	Cave Run	50.0	730	729.5
Kentucky	Carr Creek	5.0	1027	1026.9
	Buckhorn	40.0	782	781.3
Salt	Taylorsville	32.0	547	544.6
Green	Green River	49.0	675	674.2
	Nolin	49.0	515	515.3
	Barren River	53.0	552	547.9
	Rough River	50.0	495	494.9

As of Aug. 30, 2007, reservoir levels are below the normal summer pool elevation at Taylorsville Lake in Spencer County, Green River in Taylor County, Barren River Lake in Barren County, Grayson Lake in Carter County, Buckhorn Lake in Perry and Leslie counties, Yatesville Lake in Lawrence County and Fishtrap Lake in Pike County. It is noteworthy that both Barren River and Rough River lakes have been at or near the minimum release since mid-March, further evidence that the current drought conditions have been under development for some time.

Small Lakes and Water Supply Reservoirs

The Division of Water will monitor selected small water supply reservoirs when conditions indicate that water supplies may be threatened by persistent drought. While many small water-supply lakes are not abnormally low, they continue to decline under the stress of high temperatures and lack of precipitation. Increased

customer demand has forced a number of these water systems to call for conservation measures.